CHAPTER 3

OVERHEAD SIGN STRUCTURES

Introduction

Overhead sign structures support signs over the traveled roadway. The work involves furnishing and erecting of overhead sign structures, walkways, and sign lighting according to the Standard Specifications and the Contract plans. In this chapter the installation of overhead sign structures will be broken down into pre-construction, construction inspection, and measurement and payment duties.

Like ground mounted signs, it is important for the technician to do his homework to anticipate any problem areas in the plans and proposal before they become the controlling operation. If the technician is unfamiliar with the installation of overhead sign structures, the following sources need to be reviewed.

* Sections 702, 803, 909.01, and 909.02 of the current Standard Specifications.
* Standard Sheets 802-SNOH-01 thru 802-SNOH-16 and 802-SNWW-01 thru 802-SNWW-11.

Pre-Construction Duties

Overhead sign structures involve much tighter horizontal and vertical tolerances than ground mounted signs. The technician needs to become familiar with both the plan and quantity sheets before any work is started on the contract and preferably before the pre- construction conference. The following items need to be considered:

Pre-Construction Duties (cont'd)

* Prior to the fabrication of an overhead sign structure, shop drawings shall be submitted by the contractor's supplier to the INDOT division of Design.
* The Contractor has the responsibility of checking the roadway cross sections and structure dimensions prior to the preparation of the shop drawings. If any discrepancies are found, the INDOT Division of Design shall be notified prior to the preparation of the shop drawings.
* Overhead sign structures shall be staked by the Construction Engineering Sub-Contractor. The overhead sign structure shall comply with the following requirements:
    * The sign structure shall be perpendicular to the pavement. A transit should be used to set the alignment stakes.
    * The outline of the foundation of the sign structure shall be staked as shown on the plan.
        * All utility clearances requirements must be observed. Since there is little or no tolerance in the location of an overhead sign structure, utility relocation may be necessary.
        * Any possible drainage structure and highway lighting circuit conflicts must be checked. A change order may be required if unplanned relocation of a drainage structure or lighting circuitry is required.
        * Final guard rail clearances must be calculated for compliance with the guard rail policy in Section 24 of the General Instructions To Field Employees.
* The length of the upright(s) is determined using the following criteria: (The calculations for truss, monotube, and cantilever sign structures are all different, but the following criteria is the same for all.)
    * The difference in elevation between the edge of pavement and the top of the concrete foundation is determined by projection the required slope(s) using the details for Shoulder or Median Guard Rail Installation as shown on Standard Sheet 802-SNGP-01.

* Use the vertical clearance as shown on the plan detail sheets. (17’ minimum and 18’ maximum)

Construction Inspection Duties

The Contractor shall not begin any work on the sign structure foundation until:

* Approved sign structure shop drawings are received by the PE/PS.
* Approved panel and sheet sign shop drawings are received by the PE/PS.
* All relocation work has been complete.

Concrete structure, Foundations

When inspecting the installation of the foundation(s) for an overhead

the following items need to be considered:

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* The Basis For Approval for the overhead sign structure and anchor bolts will be a Type C Certification. The Basis For Approval for reinforcing steel will be the the approved J number for the manufacturer. The Basis Approval for concrete will be the sequence number reported on the IT-652.
* The foundation excavation shall be completed to the levels and dimensions as shown on the plans.
* If bed rock or boulders are encountered during excavation, they shall be removed to the depth as shown on the plans.
* Excavated material not used in the backfill shall be removed within 24 hours.
* Concrete classes A, B, or C may be used in the foundations.
* Reinforcing steel shall be placed as set out in the plans and standard sheets. The following need to be checked by the technician:

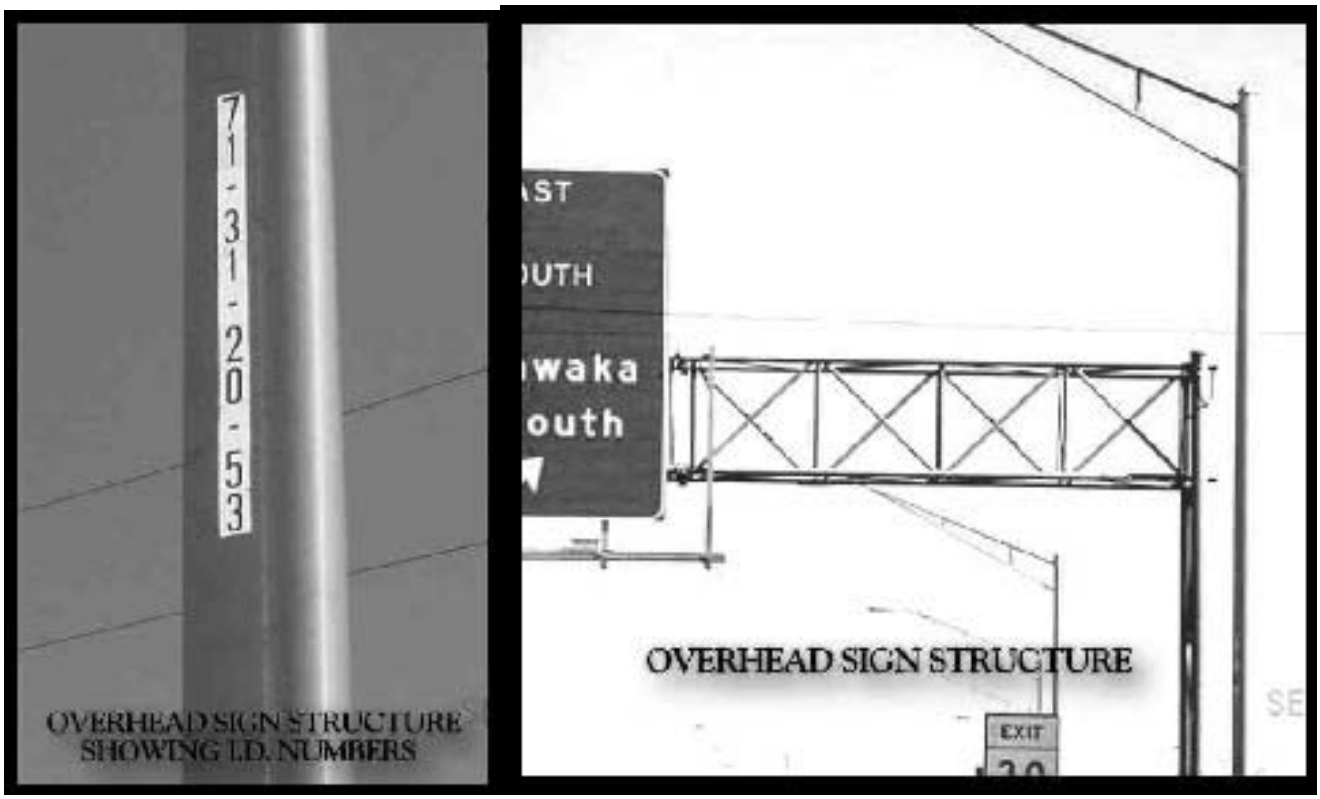
    * Proper sizing of bars.
    * Correct numbers and spacing of bars.
    * Proper bar cover.

* For cantilever sign structure foundations, a tremie will be used until the concrete is within 5 feet of the top of the foundation.
* The concrete shall be consolidated using a vibrator adequate for the size of the pour.
* Foundations incorporated into sections of concrete barrier wall shall receive a Class 2 rubbed finish.
* All other areas of exposed foundation concrete shall receive a Class 1 rubbed finish.

Structure Erection

It is the responsibility of the Contractor to handle the overhead sign structure carefully during loading, shipment, unloading, and erection to avoid damage to any member of the structure. The technician needs to consider the following items:

* The Basis For Approval for overhead sign structures and the signs is a Type C Certification.
* The structure shall be inspected before unloading, during all operations, and until the structure erection is complete. Any damage detected shall be repaired before final acceptance.
* Any field welding shall be done in accordance with Section 803 for aluminum, or Section 711.32 for steel. Before any field welding is performed, contact your PE/PS and/or Area Engineer.
* For sign trusses or monotubes, the required camber will be built onto the structure on the ground using wooden blocks.
* Gaps in the flange connections not exceeding 1/8 inch shall be shimmed before tightening the flange bolts.
* Sign, walkway, handrail, and lighting support brackets are generally installed on the ground in accordance with the approved sign structure shop drawings before the structure is lifted in place.



Sign Installation

When inspecting the installation of sign, walkway, handrail, and lighting support brackets the technician needs to consider the following items:

* The same support bracket may support the sign, the walkway, the handrail, and the lighting assembly.
* For sign widths greater than 30 inches, a minimum of two sign supports will be required.
* For sign heights of 7 feet or less, the maximum sign support spacing will be 7 feet, and the maximum sign overhang beyond the sign support will be 3.5 feet.
* For sign heights greater than 7 feet, the maximum sign supports spacing will be 5 feet, and the maximum sign overhang beyond the sign support will be 2.5 feet.
* The maximum spacing of walkway support brackets will be 7 feet, and the maximum walkway overhang beyond the walkway support brackets will be 1 foot.
* If all of the above conditions are not met, additional supports will be added.
* Panel sign clips shall be attached to teach sign support required to support the panel sign, and shall be attached as follows:

    * The top and bottom of the panel sign will be clipped to both sides of the sign support bracket.
    * The intermediate clips at one foot spacing will be staggered on either side of the sign support bracket.

OVERHEAD SIGN STRUCTURE WITH SIGNS INSTALLED

Structure Erection

During the erection of the overhead sign structure, traffic shall be safely controlled in accordance with Section 801. The following requirements shall be met:

* Three working days prior to commencing work which will require the stoppage of traffic, written notice shall be given to the District Director and the Indiana State Police. The notice shall give the specific location, time and date of the work.

Traffic Control 801.03

* Advance warning signs shall be located according to the Indiana Manual On Uniform Traffic Control Devices.
* On multi-lane divided highways a minimum of 4 flagmen will be required to control traffic and 8 flagmen will be required for road closure in both directions.
* On non-divided highways a minimum of 4 flagmen will be required to control traffic.
* Traffic stoppage shall not exceed 20 minutes at one time. There shall be enough time between consecutive stoppages to allow traffic flow to return to normal.
* No traffic shall be allowed to pass directly beneath any personnel working on an overhead structure.
* Nylon straps or other approved methods shall be used in lifting the structure, so as not to damage the structure.
* When structure erection is started, it shall be completed the same day. This is to prevent damage caused by wind vibration of the upright.

Measurement And Payment Duties

Items used in the installation of overhead sign structures are measured and paid for as follows:

* Concrete dimensions shall be measured along neat lines and paid for by the cubic yard.
* Reinforcing steel shall be measured by the length and paid for in pounds after conversion according to Section 703.07.
* Each type of overhead sign structure shall be paid for as Each.
* Sheet signs attached to panel signs shall be measured by the square foot as determined by the maximum length and width of the sheet metal required to produce the sheet sign.
* Panel signs, including legend and/or copy, shall be measured and paid for by the square foot.
* Sign support brackets, sign hardware, excavation, backfill, or other incidentals needed to complete shall not be paid for directly, but the cost shall be included in the cost of the pay items.